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EXAMINER

FETZNER, TIFFANY A

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 11/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/003,837

Applicant(s)

PECK ET AL.

Examiner

Tiffany A Fetzner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 38 and 39 is/are allowed.
- 6) ☒ Claim(s) 1-37 and 40-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) .
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED Final ACTION

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103 (c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on June 13th 2002, October 7th 2002, and August 7th 2003 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner. The attached examiner initialed forms shows the consideration dates.

Response to Arguments

3. Applicant's arguments, see the amendment of September 16th 2003, filed September 2nd 2003, with respect to the rejection(s) of claim(s) 1-56 under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejection concerning these claims with respect to the **Freedman et al.**, reference US patent 6194900 issued February 27th 2001, with an effective date of June 19th 1998 has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of **Webb et al.**, US patent 6,456,072 B1 issued September 24th 2002; with an effective date of May 26th 2000; where the new grounds of rejection has been

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necessitated by applicant's amendments to **claims 1-37**, and **40-55**, in combination with **new claims 56-59**.

4. The examiner notes that there are still improper incorporations by reference to publications that are not US patents, therefore applicant's arguments regarding incorporation by reference are not persuasive, because the improper incorporation by reference, is related to the incorporation by reference of publications, which is improper. Any essential material related to applicant's invention from a publication (i.e. journal articles are publications) must be provided in the disclosure, as publications may not be incorporated by reference.

5. The applicant's declaration concerning the **LI et al.**, reference is proper.

Drawings

6. The formal drawings submitted June 2nd 2002 have been approved by the official draftsman and are acceptable to the examiner.

Specification

7. The **incorporation of essential material in the specification by reference to a** foreign application, or foreign patent, or to a **publication is** still maintained as **improper**. Applicant is still required to amend the disclosure to include the material incorporated by reference, to any foreign application, or foreign patent, or **publications**. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating that the amendatory material consists of the same material incorporated by reference in the referencing application. See *In re Hawkins*, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); *In re*

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Hawkins, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); and In re Hawkins, 486 F.2d 577, 179 USPQ 167 (CCPA 1973).

8. The examiner notes that **only non-essential material from issued US patents may be incorporated by reference**, the incorporation by reference of Journal articles, and non-issued US applications is not permissible in US patent applications and must be removed from applicant's disclosure.

9. A review of applicant's September 16th 2003 amendment shows that the amended specification paragraphs, have failed to correct the concerns from the first office action. The citations below are from the original specification disclosure, since the amended paragraphs are devoid of col. and line numbers. There are incorporation by reference issues in both paragraphs on pages 14 and 21 of the amendment.

10. With respect to original disclosure the following corrections still need to be made:

A) On page 3 paragraph 2 delete the last line, "which are also incorporated herein by reference in its entirety for all purposes."

B) On page 4 paragraph 1 delete the phrase, "incorporated herein by reference in its entirety for all purposes", from lines 1 and 2.

C) On page 5 paragraph 2, indent the word "small" so that the new paragraph is more clearly visible and delete the phrase, "the entire disclosure of which is incorporated herein by reference in its entirety for all purposes", from lines 3 and 4.

D) On page 24 paragraph 2, line 6 delete the phrase, "and incorporated herein by reference for all purposes".

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E) On page 26 paragraph 1, indent the word "The" so that the new paragraph is more clearly visible and delete the phrase, "the entire disclosure of which is incorporated herein by reference in its entirety for all purposes", from lines 4 and 5.

5. The disclosure is objected to because of the following informalities:

A) Regarding applicant's disclosure, the phrases "**for example**", "**such as**", and "**or the like**" raise the issue of indefiniteness in applicant's description under 35 USC 112 second paragraph because it is unclear whether the limitation(s) following the phrase are part of the applicant's invention, and under 35 U.S.C. 112, second paragraph, applicant's disclosure must "particularly point out and describe the subject matter which applicant regards as the invention. The applicant **still** needs to delete the phrase "for example" from all occurrences within the specification as a means of overcoming this objection.

A1) Delete "for example" on page 2 paragraph 1 line 3.

A2) Delete "for example" on page 3 paragraph 1 line 1.

A3) Delete "for example" on page 4 paragraph 2 line 2.

A4) Delete "for example" on page 5 paragraph 1 line 1.

A5) Delete "for example" on page 11 paragraph 1 three line from the bottom of paragraph 3.

A6) Delete "for" on page 11 paragraph 1 at the end of the last line.

A7) Delete "example" on page 12 paragraph 1 line 1, at the beginning of the first line.

A8) Delete "for example" on page 14 paragraph 1 line 3.

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- A9) Delete "for example" on page 14 paragraph 1 line 7.
- A10) Delete "for example" on page 17 paragraph 1 line 3.
- A11) Delete "for example" on page 17 paragraph 3 line 4.
- A12) Delete "for example" on page 18 paragraph 2 line 4.
- A13) Delete ". Examples" on page 18 paragraph 3 line 1 and insert "which".
- A14) Delete ". Examples" on page 19 paragraph 2 line 3 and insert "which".
- A15) Delete ". Examples" on page 19 paragraph 3 line 4 and insert "which".
- A16) Delete ". Examples" on page 19 paragraph 3 line 6 and insert "which".
- A17) Delete "or the like" on page 20 paragraph 1 line 9.
- A18) Delete "example of an" on page 20 paragraph 1 line 9.
- A19) Delete "Examples of cross-sectional" on page 20 paragraph 3 line 2 and insert "Cross-sectional".
- A19) Delete "For example, in an" on page 22 paragraph 1 line 6 and insert An".
- A20) Delete the second "for" on page 24 paragraph 3 line 4.
- A21) Delete "example" on page 24 paragraph 3 line 5.
- A22) Delete "For example, in" and insert "In" on page 26 paragraph 2 line 6.
- A23) Delete "for example" on page 27 paragraph 2 line 3.
- A24) Delete the "for" on page 27 paragraph 3 line 2.
- A25) Delete "example" on page 27 paragraph 3 line 3.
- A26) Delete "for example," on page 28 paragraph 2 line 3.
- A27) Delete "In another example" on page 28 paragraph 2 line 4 and insert "Alternatively".

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A28) Delete "Examples of such" on page 30 paragraph 1 line 6 and insert "Capillary-LC/micro-NMR".

A29) Delete "for example," on page 32 paragraph 1 line 2.

A30) Delete ". Examples, for instance, include" on page 32 paragraph 1 lines 4-5, and insert ", including".

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. **Claims 1-27, 29, 31-37, 40-45, 49-52, and 54-59** are rejected under **35 U.S.C. 103(a)** as being unpatentable over **Webb et al.**, US patent 6,456,072 B1 issued September 24th 2002; with an effective date of May 26th 2000.

14. With respect to **Amended NMR system Claim 1**, and corresponding **Amended NMR probe claim 18**, **Webb et al.**, teaches, shows, and suggests "An NMR system comprising, in combination: an NMR probe" [See figures 1, 2, 8; col. 1 line 66 through

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col. 10 line 38; abstract "comprising multiple NMR detection sites" (See 1, 2, 8; components 24, 22A-22D; 26A-26D; 38; a detection site is considered by the examiner to be the location where the fluid from at least one of the samples 22A-22B flows through component 38 and passes through the section of component 38 where microcoils 26A-26D are located), "wherein each NMR detection site comprises a sample holding void" [See components 22A-22D in figures 1 and 2; components 22A-22P in figure 8] "and an associated NMR microcoil", [See components 26A-26D in figures 1 and 2; components 26A-26P in figure 8] and wherein each NMR microcoil is operative to detect one or more analytes in the sample holding void with which the microcoil is associated; [See figures 1, 2, and 8; col. 1 line 66 through col. 10 line 38; abstract] "and a controllable fluid router operative to direct fluid sample to the multiple NMR detection sites". [See Figures 1, 2, 8; components 24, 22A-22D; 26A-26D; 38; 25A-25D; 60-67].

15. **Webb et al.,** lacks directly teaching the terms "detection site" or "sample holding void" However, It would have been obvious to one of ordinary skill in the art, at the time that the invention was made that the teachings and figures of the **Webb et al.,** reference contain structures suggest features that read on these limitations because the location where the fluid from at least one of the samples 22A-22B flows through component 38 and passes through the section of component 38 where microcoils 26A-26D are located is the site at which a detectable signal from the fluid sample is acquired; and the components sample A through Sample D identified as components 22A-22D are effectively "a sample holding void". Therefore even though the exact

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terminology is not explicitly stated, it would have been obvious to one of ordinary skill in the art at the time that the invention was made that the applicant's terminology is an equivalent for the structures taught and shown in the **Webb et al.**, reference.

16. With respect to **Claim 2, Webb et al.**, shows and teaches that "the multiple NMR" sample sites are integrated in a probe module." [See **Webb et al.**, Figures 1, 2, 4, 5, and 8; col. 5 line 40 through col. 6 line 9] The same reasons for rejection, and obviousness, that apply to **claim 1** also apply to **claim 2**.

17. With respect to **Claim 3**, and **corresponding claim 22**, which depends from **claim 21, Webb et al.**, shows and teaches that "the sample holding void" (i.e. the sample holding space that exists between the 355 micrometer outer diameter and 180 micrometer inner diameter of the polyimide coated fused silica capillary Teflon flow tubes) [See col. 6 lines 28-36] "of each of the NMR detection sites" (i.e. each respective NMR sample tube around which a microcoil is wound) is in "a capillary-scale fluid channel in an NMR probe module" [See col. 3 lines 21-34; where liquid samples are used, and loaded into the micro capillary sample tubes of col. 6 lines 28-36, from the Teflon flow tubes attached to both ends of the capillary tubes. See also Figures 1, 2, 4, 5, and 8. The examiner considers the fluid flow tubes into the micro capillary sample tube to be a type of "capillary-scale fluid channel in an NMR probe module".] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1**, and **2**, apply to **claim 3**, and the same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, and 21** also apply to **claim 22**.

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18. With respect to **Claim 4**, and **corresponding claim 23**, which depends from **claim 21, Webb et al.**, shows and teaches that "The sample holding void of each of the NMR detection sites is in a micro-scale fluid channel in the module." [See col. 3 lines 21-34; where liquid samples are used, and loaded into the micro-capillary sample tubes of col. 6 lines 28-36, from the Teflon flow tubes attached to both ends of the capillary tubes. See also Figures 1, 2, 4, 5, and 8. The examiner considers the fluid flow tubes into the micro-capillary sample tube to be a type of "micro-scale fluid channel in an NMR probe module".] The same reasons for rejection, obviousness, and motivation to combine, that apply to **claims 1, 2, and 3**, apply to **claim 4**, and the same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, and 21** also apply to **claim 23**.

19. With respect to **Claim 5, Webb et al.**, shows and teaches that "The controllable fluid router" (i.e. the switch means component 24 in figures 1, 2, and 8) "is operative in response to an electrical input signal." [See col. 3 line 39 through col. 10 line 37] The same reasons for rejection, and obviousness, that apply to **claim 1** also apply to **claim 5**.

20. With respect to **Claim 6, Webb et al.**, shows and teaches that "the controllable fluid router" (i.e. the switch means component 24 in figures 1, 2, and 8) "is operative to direct fluid sample to any selected ones of the NMR detection sites." [See col. 3 line 39 through col. 10 line 37; and Figures 1, 2, and 8 especially figure 8 where multiple pluralities of coils can be connected in a switchable manner.] The same reasons for rejection, and obviousness, that apply to **claim 1** also apply to **claim 6**.

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21. With respect to **Claim 7, Webb et al.**, shows and teaches that "the controllable fluid router" (i.e. the switch means component 24 in figures 1, 2, and 8) "is operative to direct fluid sample to any selected ones of the NMR detection sites corresponding to the "input signal." [See col. 3 line 39 through col. 10 line 37; and Figures 1, 2, 3, and 8] The same reasons for rejection, and obviousness, that apply to claim 1 also apply to **claim 7**.

22. With respect to **Claim 8, Webb et al.**, shows and teaches that "an operative component" (i.e. transmit and receive component 36) "in communication with the router" (i.e. the switch means component 24 in figures 1, 2, and 8) "and operative to generate the Input signal to the router." (i.e. the switch means component 24 in figures 1, 2, and 8) [See col. 3 line 39 through col. 10 line 37; and Figures 1, 2, 3, and 8] The same reasons for rejection, and obviousness, that apply to **claims 1, 7** also apply to **claim 8**.

23. With respect to **Claim 9, Webb et al.**, suggests, shows and teaches that "the multiple NMR sites and the operative component are integrated in a probe module." [See Figures 1, 2, 3, 4, 5, 8; col. 5 line 40 through col. 6 line 9] The same reasons for rejection, and obviousness, that apply to **claims 1, 7, 8** also apply to **claim 9**.

24. With respect to **Claim 10, Webb et al.**, suggests, and teaches that "a controller unit" (i.e. computer based controller 32) "in communication with the router" (i.e. the switch means component 24 in figures 1, 2, and 8) "and operative to generate the input signal to the router" [See col. 3 line 39 through col. 10 line 37; and Figures 1, 2, 3, and 8] The same reasons for rejection, and obviousness, that apply to **claims 1, 7** also apply to **claim 10**.

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25. With respect to **Claim 11, Webb et al.**, suggests, and teaches that "the multiple NMR sites and the controller unit are integrated in a probe module." [See Figures 1, 2, 3, 4, 5, 8; col. 5 line 40 through col. 6 line 9] The same reasons for rejection, and obviousness, that apply to **claims 1, 7, 10** also apply to **claim 11**.

26. With respect to **Claim 12, Webb et al.**, suggests, "a controller unit" (i.e. computer based controller 32) operative to receive information from any of the multiple NMR detection sites and to generate the input signal to the router" (i.e. the switch means component 24 in figures 1, 2, and 8) "based at least in part on said information." [See col. 3 line 39 through col. 10 line 37; and Figures 1, 2, 3, and 8] The same reasons for rejection, and obviousness, that apply to **claims 1, 5** also apply to **claim 12**.

27. With respect to **Claim 13, Webb et al.**, suggests, "an operative component" (i.e. transmit and receive component 32) "and a controller unit" (i.e. computer based controller 32) "operative to receive information from the operative component and to generate the input signal to the router" (i.e. the switch means component 24 in figures 1, 2, and 8) "based at least in part on said information." [See col. 3 line 39 through col. 10 line 37; and Figures 1, 2, 3, and 8] The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 12** also apply to **claim 13**.

28. With respect to **Claim 14, Webb et al.**, suggests, and shows "the operative component" (i.e. transmit and receive component 32), "the controller unit (i.e. computer based controller 32) "and the multiple NMR sites are integrated in a probe module." [See Figures 1, 2, 3, 4, 5, 8; col. 5 line 40 through col. 6 line 9] The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 12, 13** also apply to **claim 14**.

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29. With respect to **Claim 15, Webb et al.**, suggests, and shows "one or more of the multiple NMR detection sites are in communication with a data processing unit." [See col. 2 line 66 through col. 3 line 30; col. 4 line 19 through col. 5 line 39; Figures 1, 2, 3, and 8] The same reasons for rejection, and obviousness, that apply to **claim 1** also apply to **claim 15**.

30. With respect to **Claim 16, Webb et al.**, teaches "the data processing unit is integrated in a probe module." [See col. 2 line 66 through col. 3 line 30; col. 4 line 19 through col. 5 line 39; Figures 1, 2, 3, and 8] The same reasons for rejection, and obviousness, that apply to **claims 1, 15** also apply to **claim 16**.

31. With respect to **Claim 17, Webb et al.**, suggests, "the data processing unit provides an input signal to the controllable router". [See col. 2 line 66 through col. 3 line 30; col. 4 line 19 through col. 5 line 39; Figures 1, 2, 3, and 8] The same reasons for rejection, and obviousness, that apply to **claims 1, 15** also apply to **claim 17**.

32. With respect to **Amended Claim 19**, this claim is just an independent version of **claims 1, 5, and 10**, therefore, the same reasons for rejection, and obviousness, as those already given in the rejection of **claims 1, 5, 7, and 10**, apply to **claim 19**, and need not be reiterated.

33. With respect to **Amended Claim 20, Webb et al.**, teaches, shows and suggests "A NMR probe module comprising: at least one fluid inlet port, operative to receive a fluid sample", [See Figures 1, 2, and 8; col. 6 lines 23-36 where the Teflon flow-tubes attached at both ends of the micro-capillary tubes comprise an inlet/outlet port] "a fluid pathway comprising multiple channels in fluid communication with the at least one fluid

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inlet port for the transport of fluid sample to be tested;" [See Figure 8; col. 3 lines 21-34 where fluid samples are loaded] **Webb et al.**, teaches, shows and suggests the limitations of "multiple NMR detection sites" (i.e. multiple locations for detecting liquid samples in capillary tubes over which a microcoil is wound), "each in fluid communication with at least one of the multiple channels, each comprising: a sample holding void, and an associated NMR microcoil; and a controllable fluid router operative to direct fluid sample in the module to at least a selected one of the multiple channels", for the same reasons as those previously given with respect to **claims 1, and 18** therefore, the same reasons for rejection, and obviousness, that apply to **claims 1, 18** also apply to **claim 20** and need not be reiterated.

34. With respect to **Claim 21, Webb et al.**, teaches, shows and suggests "the controllable fluid router is operative in response to an electrical input signal to direct fluid sample in the module to at least a selected one of the multiple channels corresponding to the input signal", because this limitation is just a combination of **claims 5 and 7**, therefore the same reasons for rejection, and obviousness, as those previously given with respect to **claims 1, 5, 7, 18, and 20**, also apply to **claim 21** and need not be reiterated.

35. With respect to **Claim 24, Webb et al.**, teaches, shows and suggests "an outlet port in fluid communication with the fluid pathway." [See Figures 1, 2, and 8; col. 6 lines 23-36 where the Teflon flow-tubes attached at both ends of the micro-capillary tubes comprise an inlet/outlet port, "in fluid communication with the fluid pathway."] The same

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reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, and 20**, also apply to **claim 24** and need not be reiterated.

36. With respect to **Claim 25, Webb et al.**, teaches, shows and suggests that "each multiple NMR detection site is optimized for different nuclear species." [See col. 7 line 15 through 55 especially lines 29-39 where each coil is filled with a different liquid sample compound.] The same reasons for rejection, and obviousness, that apply to **claims 1, 18, 20** also apply to **claim 25** and need not be reiterated.

37. With respect to **Amended Claim 26, Webb et al.**, teaches that "at least one of the multiple NMR detection sites is optimized for 1 dimensional NMR study," [See col. 7 lines 29-61] The same reasons for rejection, and obviousness, that apply to **claims 1, 18, 20** also apply to **claim 26** and need not be reiterated.

38. With respect to **Claim 27, Webb et al.**, lacks directly teaching that "at least one of the multiple NMR detection sites is optimized for 2 dimensional NMR study." However, **Webb et al.**, teaches that multi-dimensional (i.e. 2d, or 3d or higher dimensionality) high resolution NMR spectra can be acquired from multiple samples in the same time that it takes to acquire a single spectrum. [see col. 8 lines 4-9] Therefore, the ability to optimize the **Webb et al.**, techniques "for 2 dimensional NMR study" is directly suggested by the **Webb et al.**, reference. The same reasons for rejection, and obviousness, that apply to **claims 1, 18, 20** also apply to **claim 27** and need not be reiterated.

39. With respect to **Claim 29, Webb et al.**, lacks directly teaching that "the multiple NMR detection sites are optimized using different materials." However, **Webb et al.**,

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teaches that the spectral width and transmitter frequency were optimized for each of the different samples, and each sample is a different material compound. [See col. 7 lines 33-55] therefore **Webb et al.**, does suggest that "the multiple NMR detection sites are optimized using different" sample "materials" even though the exact terminology as claimed is lacking." The same reasons for rejection, and obviousness, that apply to **claims 1, 18, 20** also apply to **claim 29** and need not be reiterated.

40. With respect to **Amended Claim 31**, **Webb et al.**, teaches that "the multiple NMR detection sites are made of fused silica" [See col. 6 line 33] and polytetrafluoroethylene", because the registered trademark of "Teflon" is by definition "polytetrafluoroethylene". Applicant is directed to the trademark section of the MPEP, where the definition of "Teflon" is "polytetrafluoroethylene". Additionally, because component 38, which attaches to the fused silica capillaries in figures 1 and 2, are made of "Teflon", [See col. 6 lines 28-36] It would have been obvious to one of ordinary skill in the art at the time that the invention was made, that **Webb et al.**, teaches and suggests the limitation that "the multiple NMR detection sites are made of fused silica and "polytetrafluoroethylene", (i.e. "Teflon"). The same reasons for rejection, and obviousness, that apply to **claims 1, 18, 20** also apply to **claim 31** and need not be reiterated.

41. With respect to **Claim 32**, **Webb et al.**, suggests that "each of the multiple NMR detection sites are optimized differently" [See col. 7 lines 33-55] The same reasons for rejection, and obviousness, that apply to **claims 1, 18, 20** also apply to **claim 32** and need not be reiterated."

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42. With respect to **Claim 33, Webb et al.**, teaches and shows that "the microcoil is helical, solenoidal or spiral." [See Figures 1, 2, 9; and col. 3 line 66 through col. Col. 4 line 14.] The same reasons for rejection, and obviousness, that apply to **claims 1, 18, 20** also apply to **claim 33** and need not be reiterated.

43. With respect to **Claim 34, Webb et al.**, teaches that the microcoil may be a surface coil, or a coil array. [See col. 3 line 66 through col. Col. 4 line 6] **Webb et al.**, also suggests from figure 3 that coils 26 may be planar, surface coils. Therefore **Webb et al.**, teaches, shows and suggests that "the microcoil is planar" [See Figure 3, col. 3 line 66 through col. Col. 4 line 6]. The examiner notes that unless otherwise stated a "surface coil" in the MRI / NMR art is conventionally planar, two-dimensional coil. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20** also apply to claim **34** and need not be reiterated.

44. With respect to **Claim 35, Webb et al.**, teaches and suggests "an analyte extraction chamber" (i.e. the Teflon flow tubes attached to both of the fused silica capillary) "in fluid communication with at least one of the "NMR detection sites", (i.e. the fused silica capillary in which the liquid samples are loaded. [See col. 6 lines 26-36] The same reasons for rejection and obviousness, that apply to **claims 1, 18, 20** also apply to **claim 35** and need not be reiterated.

45. With respect to **Claim 36, Webb et al.**, teaches and suggests "the analyte extraction chamber is operative to perform liquid chromatography. [See col. 3 lines 30-34]. The same reasons for rejection, and obviousness, that apply to **claims 1, 18, 20, 35** also apply to claim **36** and need not be reiterated.

46. With respect to **Claim 37, Webb et al.**, teaches and suggests "the analyte extraction chamber is operative to perform capillary electrophoresis." [See col. 3 lines 30-34; col. 6 lines 26-36]. The same reasons for rejection and obviousness, that apply to **claims 1, 18, 20, 35** also apply to **claim 37** and need not be reiterated.

47. With respect to **Claim 40, Webb et al.**, teaches and suggests "at least one operative component in communication with the fluid pathway." [See Figures 1, 2, 8; col. 3 lines 2-34; col. 6 lines 26-36]. The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, and 35**, also apply to **claim 40** and need not be reiterated.

48. With respect to **Claim 41**, The examiner notes that microcoils when activated transmit RF energy to the samples for the purpose of performing NMR analysis. [See col. 3 lines 39-65] Because the activation of a coil generates RF energy, the coil will intrinsically and automatically heat up. **Webb et al.**, teaches that the microcoils 26A-26D are an operative component, because their activation or deactivation is controlled. [See col. 3 lines 39-65] Therefore **Webb et al.**, teaches and suggests to one of ordinary skill in the art at the time that the **Webb et al.**, invention was made that "the operative component is a heating device" . The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 41** and need not be reiterated.

49. With respect to **Claim 42, Webb et al.**, lacks directly teaching that "the operative component is a sonication device", " However it would have been obvious to one of ordinary skill in the art, at the time that the invention was made that the activation or

deactivation of switches 24, 60, 62, 64, or 66 produces a sound therefore, the switches of the **Webb et al.**, reference function as a sound producing or "sonication device", in the course of the normal processing of the NMR samples in the **Webb et al.**, device, therefore "a sonication device", is suggested from figures 1, 2, 8; and the teachings of col. 1 line 66 through col. 10 line 38. The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 42** and need not be reiterated.

50. With respect to **Claim 43, Webb et al.**, suggests and shows, from figures 1, 2, 8; col. 3 lines 2-34; and col. 3 lines 39-65; that "the operative component is "a reaction site" (i.e. the interaction with the RF excitation signal with the liquid sample, inside capillary member 38). The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 43** and need not be reiterated.

51. With respect to **Claim 44, Webb et al.**, teaches and shows, "an electrical communication with the controllable gate". [See col. 3 line 39 through col. 10 line 38] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 44** and need not be reiterated.

52. With respect to **Claim 45, Webb et al.**, teaches and shows that "the operative component is in communication with the one or more of the NMR detector sites. [See Figures 1, 2, 4, 8; col. 8 line 4 through col. 10 line 38] The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 45** and need not be reiterated.

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53. 52. With respect to **Claim 49, Webb et al.**, teaches, shows and suggests from the abstract, and figures 1 and 2 that "the operative component is a micro controller", because switch control 34 is shown within computer based controller 32, and switch control 34 is interpreted by the examiner as being a micro-controller because it controls the switch(es) (i.e. which may be constructed on a microscale) used to activate the microcoils of the **Webb et al.**, integrated NMR device. The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 49** and need not be reiterated.

54. With respect to **Claim 50, Webb et al.**, lacks directly teaching "a memory module", however **Webb et al.**, teaches and suggests that processing circuitry 36 controls data acquisition, signal transmission/reception, and signal processing, and because memory is a location for acquired, transmitted/received and processed data in a computer processor, such as computer based controller 32; it would have been obvious to one of ordinary skill in the art, at the time that the invention was made that the processing circuitry 36, and the computer based controller 32 taught by **Webb et al.**, must necessarily have a memory device or module that communicates with the inventive integrated microcoil device. [See figures 1, 2, 8; col. 3 lines 2-20] The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 50** and need not be reiterated.

55. With respect to **Claim 51, Webb et al.**, teaches and shows that "the operative component is in communication with a data processing unit," for the same reasons as those given in the rejection of **claim 15**, that need not be reiterated, therefore The same

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reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 15, 18, 20, 35, and 40**, also apply to **claim 51** and need not be reiterated.

56. With respect to **Claim 52, Webb et al.**, teaches and suggests "the operative component is in communication with a controller unit" for the same reasons as those given in the rejection of **claim 7**, that need not be reiterated, therefore the same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 52** and need not be reiterated.

57. With respect to **Amended Claim 54, Webb et al.**, teaches and suggests "An NMR probe module comprising: at least one fluid inlet port, operative to receive a fluid sample; a fluid pathway comprising multiple fluidic channels in fluid communication with the at least one fluid inlet port", [See figures 1, 2,] "for the transport of fluid sample to be tested; and multiple NMR detection cells, each in fluid communication with a corresponding one of the multiple channels" for the same reasons as those already given in the rejection of **claim 20**, which need not be reiterated. Additionally, **Webb et al.**, shows suggests "an enlarged void for holding a fluid sample" [See components 22A through 22D because the inlet and outlet ports of component 38 are shown to be narrower in Figures 1 and 2], and an associated NMR microcoil", [See figures 1 and 2 microcoils 26A through 26D], wherein each NMR microcoil is operative to detect one or more analytes in the enlarged void with which the NMR microcoil is associated. [See figures 1 and 2; col. 3 line 39 through col. 4 line 50; col. 6 lines 23-37] The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, and 20**, also apply to **claim 54** and need not be reiterated.

58. With respect to **Claim 55, Webb et al.**, teaches, shows and suggests "a controllable fluid router operative to direct fluid sample in the module to selected ones of the multiple channels", [See figures 1, 2, 4, 5, 8; col. 8 line 10 through col. 10 line 38] for the same reasons as those given with respect to **claims 1, 18, 19, 20, and 54**, therefore the same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 19, 20, and 54**, also apply to **claim 55** and need not be reiterated.

59. With respect to **New Claim 56, Webb et al.**, teaches, and shows "an NMR probe system comprising: an NMR probe comprising two or more detection sites" [See Figures 1, 2, 3, 4, 5, 8] "at least a first NMR detection site comprising a first sample holding void in a first capillary and a first NMR microcoil associated with the first sample holding void," [See components 22A, 26A, and 38 in Figures 1 and 2] "at least a second NMR detection site independent of the first NMR detection site, the second NMR detection site comprising a second sample holding void in a second capillary and a second NMR microcoil associated with the second sample holding void," [See components 22B, 26B, and 38 in Figures 1 and 2; Figures 4 and 5] "and a controllable fluid router operative to direct fluid sample to the first and/or second NMR detection sites". [See col. 3 lines 21-34; col. 3 line 39 through col. 4 line 50] The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 19, 20, and 54**, also apply to **New claim 56** and need not be reiterated.

60. With respect to **New Claim 57, Webb et al.**, teaches and directly suggests that the invention can be modified to include the limitation that "the NMR detection is simultaneous in the first sample holding void and second sample holding void", because

Webb et al., teaches that in Figure 8 which is a nested version of figures 1 and 2 showing a plurality of coils, for each coil in figures 1 and 2; that multiple switches 24 may be present, as opposed to the single switch component 24 in Figure 8. Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made, that when the structure of Figure 8 is modified as suggested by **Webb et al.**, that with 2 of the component 24 switches activated that "the NMR detection" would have been at least "simultaneous in the first sample holding void and" in a "second sample holding void". [See col. 8 lines 29-44; Figures 1, 2, 8; and col. 8 line 10 through col. 10 line 38 in general.] The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 19, 20, 54, and 56**, also apply to **New claim 57** and need not be reiterated.

61. With respect to **New Claim 58**, **Webb et al.**, shows from Figures 1, 2, and 8 that "the first and second capillaries are parallel to each other within the NMR probe", because each of the capillaries are connected in parallel. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 19, 20, 54, and 56**, also apply to **New claim 58** and need not be reiterated.

62. With respect to **New Claim 59**, **Webb et al.**, teaches that "the first NMR microcoil is a single microcoil operative to transmit and receive." [See col. 3 lines 39 through col. 4 line 20]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 19, 20, 54, and 56**, also apply to **New claim 59** and need not be reiterated.

63. **Claims 28, 30, 46-48, and 53** are rejected under **35 U.S.C. 103(a)** as being unpatentable over **Webb et al.**, US patent 6,456,072 B1 issued September 24th 2002; with an effective date of May 26th 2000; as applied to **claims 1-27, 29, 31-37, 40-45, 49-52, and 54-59** above, and further in view of **Kucharczk et al.**, US patent 6,026,316 issued February 15th 2000; with an effective date of May 15th 1997.

64. With respect to **Claim 28, Webb et al.**, lacks directly teaching that "the multiple NMR detection sites are optimized for different sample sizes." however, However, **Kucharczk et al.**, teaches that in different environments or procedures that the coils may be located, sized, angled or otherwise designed to provide specific signals and/or responses tailored to the anticipated needs of a particular procedure, (i.e. this teaching would include the NMR spectroscopy methods of **Webb et al.**,) [See **Kucharczk et al.**, col. 18 lines 1-11]

65. It would have been obvious to one of ordinary skill in the art at the time that the invention was made that the teachings of optimization found in the **Webb et al.**, reference can be modified by the optimization techniques of **Kucharczk et al.**, which optimizes "multiple NMR detection sites", "for different sample sizes", in a magnetic resonance device, with more than one microcoil, [See **Kucharczk et al.**, col. 20 lines 47-49] because NMR/MR equipment is application or procedure dependent, and depending on the type of sample(s) used, the amount of sample(s) required to produce a detectable signal, in each micro-capillary may change, therefore it would have been obvious to one of ordinary skill in the art at the time that the invention was made, that an optimization based upon different sample sizes is also within the scope of the

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optimizations taught by the **Webb et al.**, reference. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 18, 20, and 30** also apply to **claim 28** and need not be reiterated.

66. With respect to **Claim 30, Webb et al.**, teaches that "the multiple NMR detection sites" (i.e. the micro-capillary tubes) "are made of fused silica" [See col. 6 line 33].

Webb et al., lacks directly teaching that that "the multiple NMR detection sites" (i.e. the micro-capillary tubes) "are also made of PEEK" explicitly.

67. However, **Kucharczk et al.**, teaches a method and apparatus for use with MR imaging where the MR visible microcatheter containing two or more microcoils, [See **Kucharczk et al.**, col. 20 lines 47-49] with a central tube or tubes (i.e. multiple detection sites) with other tubes forming a circular distribution around the central tube or tubes [See **Kucharczk et al.**, col. 18 lines 52 through col. 19 line 23] can be made from "Poly-Ether-Ether-Ketone" (i.e. PEEK) [See **Kucharczk et al.**, col. 4 lines 26-35] and **Kucharczk et al.**, teaches that the outer tubing (i.e. of the catheter or microcatheter) consists of flexible fused silica. [See **Kucharczk et al.**, col. 17 lines 4-14] Therefore it would have been obvious to one of ordinary skill in the art at the time that the invention was made that the microcatheter containing two or more microcoils and one or more central tubes (i.e. "the multiple NMR detection sites") "are made of fused silica" [See **Kucharczk et al.**, col. 17 lines 4-14] and "PEEK" [See **Kucharczk et al.**, col. 4 lines 26-35].

68. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the micro-capillary tubes of fused silica taught by **Webb**

et al., to include "Poly-Ether-Ether-Ketone" (i.e. PEEK) as part of the construction because the application of "Poly-Ether-Ether-Ketone" (i.e. PEEK) as part of the construction of a micro-capillary tubes of fused silica, is productive in reducing artifacts and enhancing the signals from the induced static and time varying magnetic fields.

[See **Kucharczk et al.**, col. 4 lines 14-55] The same reasons for rejection, obviousness, and motivation to combine that apply to **Amended claims 1, 18, 20** also apply to **claim 30** and need not be reiterated.

69. With respect to **Claim 46, Webb et al.**, lacks directly teaching that that "the operative component is an IR detector" explicitly. However, **Kucharczk et al.**, teaches and suggests that other operative elements in a magnetic resonance probe with a microcoil also include "an IR detector" [See **Kucharczk et al.**, col. 19 lines 2-12;]

70. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the transmitting and reception circuitry taught by **Webb et al.**, to include an additional component such as a **Kucharczk et al.**, "IR detector" because the presence of an IR detector provides means of monitoring and determining the efficiency of the microcoil in transmitting the selected RF radiation, because a deviation in transmission frequency due to a faulty microcoil, in the IR band, would be detected early, and ensure proper operation of the NMR device. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 46** and need not be reiterated.

71. With respect to **Claim 47, Webb et al.**, lacks directly teaching that that "the operative component is a photo diode array" " explicitly. However, **Kucharczk et al.**,

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teaches and suggests that other operative elements in a magnetic resonance probe with a microcoil also include a "photo diode array" because photo diode array is a visible radiation carrying element / ion detector and is met by the teachings of **Kucharczk et al.**, in col. 19 lines 2-12.

72. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the transmitting and reception circuitry taught by **Webb et al.**, to include an additional component such as a **Kucharczk et al.**, visible radiation carrying element / ion detector, and the other variants thereof taught in col. 19 lines 2-12, which include within their scope a "photo diode array" because the presence of an ultra violet radiation element, like the IR detector of claim 46, provides means of a visible radiation carrying element is yet another monitoring and determining means for ascertaining the efficiency of the microcoil in transmitting the selected RF (i.e. non visible) radiation, because a deviation in transmission frequency due to a faulty microcoil, in the Visible band, would be detected early, and ensure proper operation of the NMR device. The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, 35, 40, and 46**, also apply to **claim 47** and need not be reiterated.

73. With respect to **Claim 48, Webb et al.**, lacks directly teaching that that "the operative component is a U-V visibility array " explicitly. However, **Kucharczk et al.**, teaches and suggests that other operative elements in a magnetic resonance probe with a microcoil also include " a U-V visibility array " [See **Kucharczk et al.**, col. 19 lines 2-12;]

74. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the transmitting and reception circuitry taught by **Webb et al.**, to include an additional component such as a **Kucharczk et al.**, ultra violet radiation element (i.e. "a U-V visibility array ") because the presence of an ultra violet radiation element, like the IR detector of claim 46, provides means of monitoring and determining the efficiency of the microcoil in transmitting the selected RF radiation, because a deviation in transmission frequency due to a faulty microcoil, in the UV band, would be detected early, and ensure proper operation of the NMR device. The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, 35, 40, and 46**, also apply to **claim 48** and need not be reiterated.

75. With respect to **Claim 53, Webb et al.**, lacks directly teaching that "the operative component is a pump." However, **Kucharczk et al.**, teaches and suggests that other operative elements in a magnetic resonance probe with a microcoil also include in let tubing connected to a microinjection pump 3 or reservoir 1 for providing a solution flow to the probe. [See **Kucharczk et al.**, col. 16 lines 58-64]

76. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the transmitting and reception circuitry taught by **Webb et al.**, to include an additional component such as **Kucharczk et al.**, microinjection "pump" because the fused silica Teflon capillaries of **Webb et al.**, have an inner diameter of 180 micrometers and it would have been obvious to one of ordinary skill in the art at the time that the invention was made, that in order to ensure proper filling and flow through the capillary that a "pumping" means for microfilling the capillaries would be needed since

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the manual filling of the capillaries with the sample solution by hand, would be difficult, and not easily seen by the human eye. Additionally other sources of error resulting from the lack of a "filling pump" would be wasted sample material, unreliable results, high cost and overall inefficiency. The same reasons for rejection, and obviousness, that apply to **claims 1, 5, 7, 18, 20, 35, 40, and 46**, also apply to **claim 48** and need not be reiterated.

77. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 5, 7, 18, 20, 35, and 40**, also apply to **claim 53** and need not be reiterated.

Allowable Subject Matter

78. With respect to **Amended Claim 38**, where the novel feature is (i.e. "the analyte extraction chamber is operative to perform dynamic field gradient focusing") and **Amended Claim 39** where the novel feature is "the analyte extraction chamber is operative to perform electric field gradient focusing") each of these claims are considered to be allowable by the examiner because the claims have been re-written in independent form. It is the combination of all of the claimed limitations, in **amended claims 38, 39**, with the novel feature identified above that taken in combination with each of the other features of this claim, is the source of novelty and nonobviousness.

79. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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80. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

81. The **prior art made of record** and not relied upon is considered pertinent to applicant's disclosure.

A) Freedman et al., US patent 6194900 issued February 27th 2001, with an effective date of June 19th 1998

B) Fisher et al., PCT international application publication WO 00/50924 published August 31st 2000.

Conclusion

82. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: **until January 27th 2003** (703) 305-0430. After **January 27th 2003** (571) 272-2241

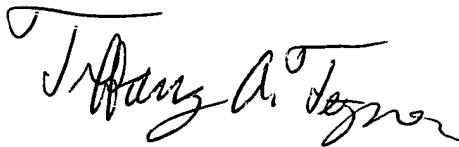
83. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

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84. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached on (703) 308-3875 **until February 10th 2003** After **February 10th 2003** (571) 272-2245.

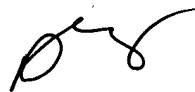
85. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(703) 872-9306**.

86. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.



TAF

November 20, 2003



Diego Gutierrez

Supervisory Patent Examiner

Technology Center 2800